

The Health Effects of Downsizing in the Nuclear Industry

Pantex

Executive Summary

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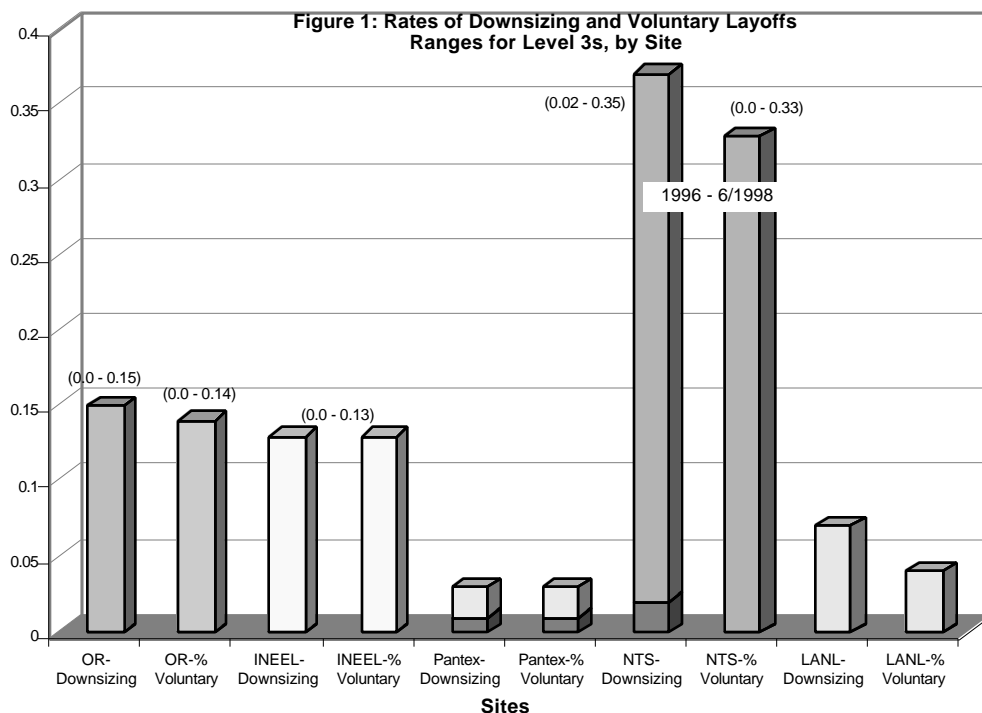
Copies of the complete report are available in the Pantex Plant Department of Energy Reading Room or contact John Campbell with Mason and Hanger (477-6616)

The Health Effects of Downsizing in the Nuclear Industry Pantex

Executive Summary

Organizational restructuring within the defense industry prompts research on health effects.

The dissolution of the Soviet Union and the ending of the Cold War in 1992 resulted in marked shifts in United States military strategy and budgets. Consequently, Congress passed Section 3161 of the National Defense Authorization Act for Fiscal Year 1993 outlining an approach to workforce layoffs in the nuclear weapons industry. Since then, there have been 46,000 layoffs of contractor employees at Department of Energy sites. More than 14,000 employees were downsized from the five study sites between September 1991 and September 1998 through voluntary and involuntary layoff events. In 1999, employment at the five sites was from nine to sixty nine percent lower than the highest employment level during the 1990's. The downsizing rates for each of the sites, including overall downsizing and the extent to which layoffs were of a voluntary nature, are presented below in Figure 1.



To better understand the impact of such downsizing and other organizational changes on both the remaining workforce and those who lost their jobs, the U.S. Department of Energy (DOE) and the Centers for Disease Control (CDC) solicited research proposals.

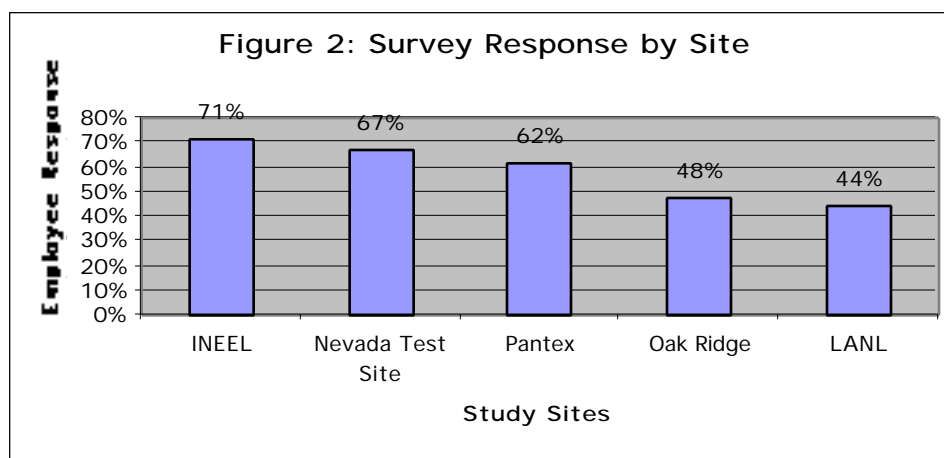
Boston University School of Public Health, with funding from the National Institute of Occupational Safety and Health (NIOSH), was selected to study and recommend ways to mitigate the impacts of workforce reductions on individual and organizational health.

This study required enormous cooperation. Our biggest thanks are to the nearly 6,000 employees who participated in focus groups or interviews and completed surveys, and to those supervisors who helped make that possible. This report was peer reviewed by two experts in the field of workplace stress and psychosocial research.

Boston University School of Public Health study is most far reaching of its kind.

Our research, covering the period from 1991 through June 1998, is the largest of its kind--in both scale and scope--to investigate the health and organizational effects of workplace restructuring. Marrying the disciplines of public health, organizational psychology and organizational management, we used several methodologies and designed a multi-level research model to best capture the complexity and variety of relevant data.

In our survey, which was only one piece of the data collection, we sampled 10,645 employees from our five study sites (or 43% of all eligible employees at those sites). We received an overall response of 55% and, at the Pantex Plant, 62% or 787 employees completed the survey. Figure 2 compares response rates by site.



Globally, downsizing and organizational restructuring have become common management tools, used to improve operational and fiscal efficiency. However, little is known, about the effects of these tools on employee health or organizational effectiveness. Therefore, the knowledge sought through this research is important for employees, unions, and other employee organizations, contractors and federal entities managing organizational change in DOE facilities, as well as for those in other industries.

We identified and investigated four key issues in downsizing, reorganization and health.

1. Downsizing will have a negative effect on individual health and workplace functioning (i.e., employee morale, work performance and job security).
2. Employees are less likely to experience negative health effects and organizations are more apt to function normally the fairer the downsizing process and the fewer direct elements of downsizing the employee experiences.
3. During periods of organizational change, one's work and work environment, including job strain*, organizational style, co-worker and supervisor support, and workplace safety will affect both individual health and workplace functioning.
4. Workplace factors including job strain, organizational climate, and the employee's perception of the fairness of the downsizing process can moderate the impact of downsizing on health and organizational outcomes.

Findings at Pantex Demonstrate Need to Develop Interventions for Improved Employee Health.

No downsizing occurred at Pantex between 1991 and 1996. This was during a time when the DOE complex was under massive restructuring and downsizing was occurring at other facilities. In fact, the employee population grew 33 percent from 2,390 to 3,327 during this period (September 1991 to September 1996). It wasn't until 1996 that Pantex first confronted the pressure to downsize its workforce.

• **Definitions of terms**

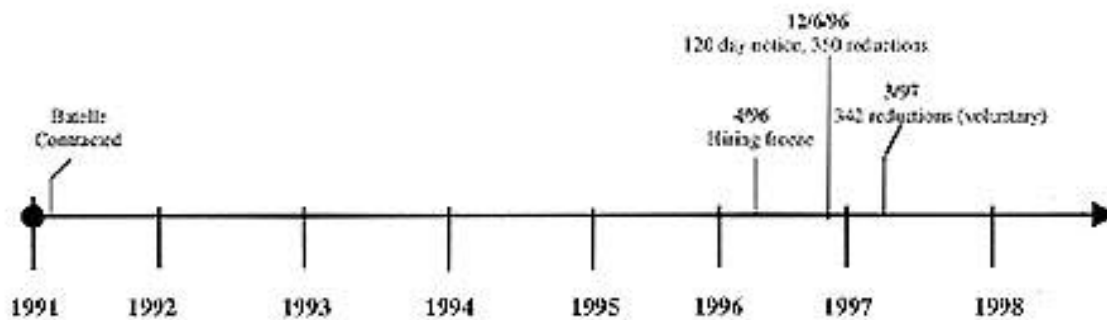
Job strain measures both the "demand" one experiences at work (physical and psychological) and the "control" an employee has over work tasks, where job control refers to the ability to structure your work, feel challenged and use your skills and training. Job strain is measured using three scales: the job demands scale, the decision authority scale and the skill discretion scale.

Organizational style refers to managerial and leadership approaches, with particular attention to how relationships and problems are handled. We looked at the company's organizational style using four scales on: 1) handling conflict, 2) the relationship with the DOE, 3) how management communicates with employees, and 4) workplace violence.

Organizational climate is used here as an umbrella term for work environment issues. We include the components of organizational style listed above (four scales) as well as co-worker and supervisor support and workplace health and safety (three scales measuring general safety, toxic exposure and exposure to noise).

We chose the Pantex Plant as a study site for the following reasons: it is a medium sized site, it is located in a small city (Amarillo) and the DOE is the major employer for the region.

FIGURE 1: Timeline of Pantex Downsizing Events



Our research yielded the following five site-specific findings at Pantex.

1. Employees who perceived that downsizing was implemented with clearly explained reasons, worker input, open, respectful, truthful and unbiased communication with employees, and consistent and fair rules experienced fewer negative health effects.
 - A process perceived as just and fair was associated with fewer reported medical symptoms.
 - The more fair the downsizing, the less job insecurity was expressed.
2. Employees who reported more direct experiences of the downsizing performed worse on three of the nine outcome measures.
 - A higher score on the downsizing experiences index was associated with lower mental health score (MCS) and higher perceived stress.
 - The more downsizing elements experienced, the more instances of poor work performance.
3. Employees who have experienced greater job strain have reported an increase in adverse individual and organizational functioning outcomes.
 - Workers with higher job strain have increased reporting of medical symptoms.
 - Higher job strain was associated with poorer reported mental health status (lower MCS, and greater survivor syndrome and perceived stress).
 - Morale and job security were lower for employees who reported high strain.
4. A supportive supervisor and co-workers, good organizational relations and a safe workplace were associated with better employee health and organizational functioning.

Employees reporting greater support from their manager and co-workers have higher morale.- Employees reporting greater support from their co-workers report fewer instances of poor work performance, have better mental health status (higher MCS score) and less perceived stress.

 - Employees who perceive that their managers have good relations with DOE report fewer medical symptoms, a lower survivor syndrome score, and better mental health status (higher MCS score).
 - Employees who perceive exposure to a toxic environment report more medical symptoms.

5. Employees who experience threats or acts of violence, harassment or discriminatory treatment have worse health outcomes.
 - Employees who report more experiences of violence, harassment or discriminatory treatment report more medical symptoms, greater stress, and less job security.
6. Employees expressed some consistent concerns in employee discussion groups, interviews and comments written on the surveys. We heard that:
 - there was general satisfaction and trust in their supervisors and managers who they saw as accessible and involved.
 - there was general dissatisfaction towards upper management who were seen as being less visible and desensitized to the difficulties employees encounter than middle management.
 - notification and communication regarding downsizing were particular concerns with employees having experienced two extremes regarding downsizing notices: a single day in 1988 and a long period of mourning in 1997.
 - some employees expressed frustration with diminished control in their jobs related to shifting priorities, an excess of regulations and a hierarchy of approval necessary for change.
 - there was an increased safety climate at Pantex, partially due to an enhancement of the Voluntary Protection Program (VPP), and that some workers noted a strained dynamic between stop work authority and the productivity concerns of management.

Pantex findings are similar to findings at four other study sites.

At all five sites, our survey, focus group and interview data show the importance of a fair and just downsizing process on employee health. Surprisingly, unlike the other sites, the downsizing rate was associated with more outcomes than the other four study sites where it was only significantly associated with a total of three outcomes. Unlike the other sites, downsizing process variables at Pantex were associated fewer significant outcomes. High job strain had negative effects on employee health and organizational functioning at all of the study sites and at Pantex it was significantly associated with six of nine outcomes.

The experience of violence or harassment predicted increased health symptoms, greater stress, and less job security. Support from one's supervisors, and especially co-workers, was important at Pantex.

Study employs various methods to understand the complexity of downsizing and organizational change.

We used multiple approaches to collect and compare information about the extent of downsizing, employees' perceptions of the downsizing, workplace safety and other organizational issues. Through our interviews with key individuals, focus group discussions and work-site observations, we were able to glean characteristics and themes within the workplace as perceived by the employees themselves. This qualitative data revealed aspects of employee culture and organizational climate that could not be obtained with other research techniques.

A central source of data was the responses to the *Boston University Workplace Survey*. The survey was sent to a random selection of 1,273 Mason & Hanger employees. We received a response of 787(62%) from Mason & Hanger employees. This survey, based on our review of relevant literature and knowledge gained from interviews and focus group discussion, was pilot tested at four sites, reviewed by NIOSH institutional boards and then revised.

We also reviewed archival records (including sick time data, overtime usage, downsizing data and accident and illness data, medical services utilization, etc.) for their potential use in this research.

Researchers maintained a high level of communication with employees and their communities throughout the study.

Throughout our research, we maintained the highest levels of communication with employees and members of their communities. We sponsored town and community meetings to relay information about and receive feedback on our study. We obtained informed consent from employees involved in any interview, focus group or who completed the employee survey. At various stages of the research we made available information about the study and research updates for publication in site and local media. Additionally, we established a study e-mail account and posted information on the World Wide Web. We will be presenting our results at each site and will make available written materials at all sites and by request from researchers and on the Web.

Researchers recommend interventions that target many levels of the organization and include further research.

Our findings point to many ways to mitigate negative impacts on employee health and workplace functioning. In order to be most effective, an intervention design should address the following three organizational levels and should feature a variety of approaches. We provide here only a few examples within each category. Our complete list of recommendations can be found in the final report for the Pantex Plant: The Health Effects of Downsizing in the Nuclear Industry: Findings at the Pantex Plant.

At the policy and structural level, interventions should include, for example, programs and policies to address: any incidence of workplace harassment and

violence; flexible work schedules that respond to employee concerns about workload, work demand and poor work-home balance; and preparation and training of managers who must plan or implement a downsizing or restructuring event.

Interventions that address procedures and group functioning should include, for instance: training for managers on effective supervision and communication; employee training on workplace diversity; and programs that encourage employees to respond to workplace change openly.

Individual level interventions should include, for example: sessions on exercise and stress reduction; collaboration with employees to redesign jobs or work stations; and information that use of the Employee Assistance Program will not detrimentally affect one's career.